Modernization and Development Through Changing Population Dynamics

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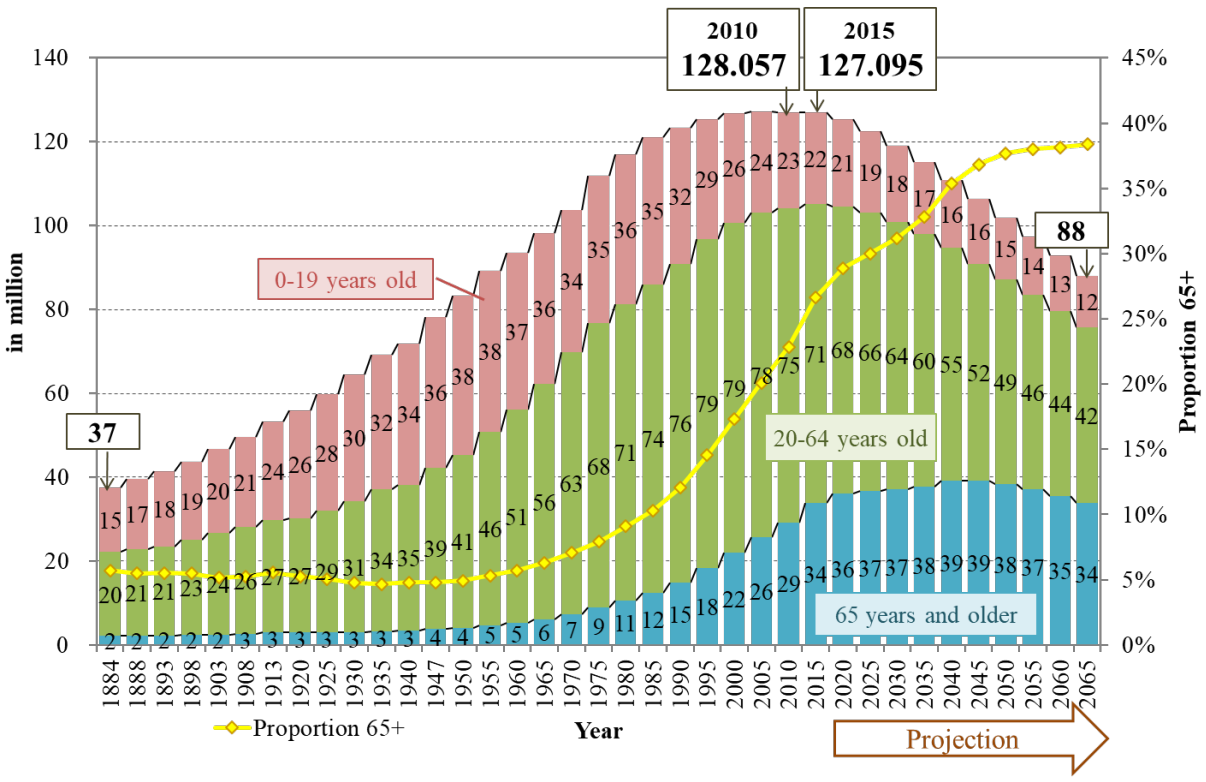
1. Introduction

Japan, now with 127 million population counted in the population census of 2015, is the most aged society in the world. The proportion of older persons aged 65 years and older was 26.6% in 2015, keeps on increasing to attain 28.4% in August 2019, and is expected to increase nearly to the level of 40% in 2050s (Figure 1). However, in contrast to the ever increasing proportion, the number of older persons will not increase much, due to the total population decline. The number of aged 65 and older is 34 million in 2015, expected to increase only to 39 million in 2040 then slightly decrease. The population ageing is taken for granted and now the main challenge is the population decline. The 2015 census was the first time in the census history to record population decline, and it is estimated to continue. When we see the trend of total population, it smoothly increased from 37 million in 1884 to 128 million in 2010, then decreases also smoothly to 88 million in 2065, in the shape like the Fuji mountain.

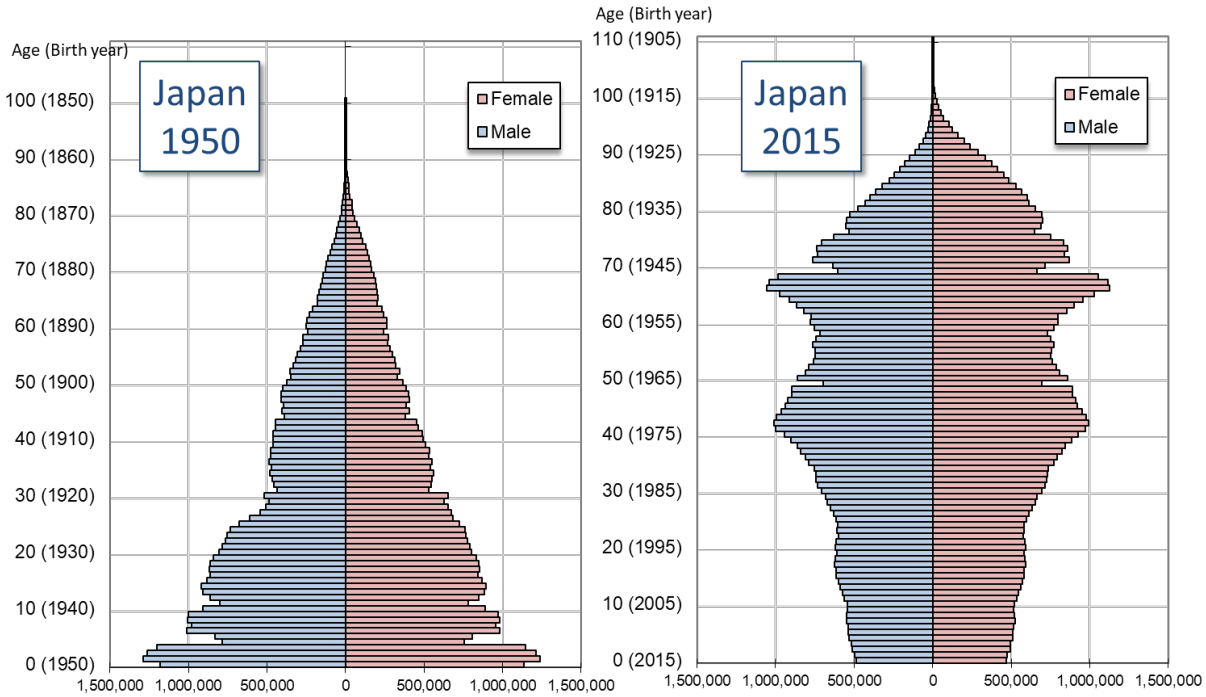
Figure 1 Population of Japan by age group and proportion of elderly aged 65+



Note: The first count of total population in Meiji period was 34.8 million in 1872 but age group disaggregation is only available from 1884.
Source : 1884 to 1913 by Family Register, 1920 to 2015 by Population Census, Statistics Bureau, 2020 to 2065 by Population Projections for Japan, medium-fertility and medium-mortality assumption (2017) National Institute of Population and Social Security Research

Population matters with size, but also with structure. The population pyramid, expressed by gender and by age, looks like the real Egyptian "pyramid" in 1950, larger in younger age, smaller in the older ages. In 2015, it changed to the "bell" shape or even similar to the shape of "atomic bomb cloud", larger in older age and smaller in younger age (Figure 2). These population structures create different needs of society.

Figure 2 Population pyramid in 1950 and 2015



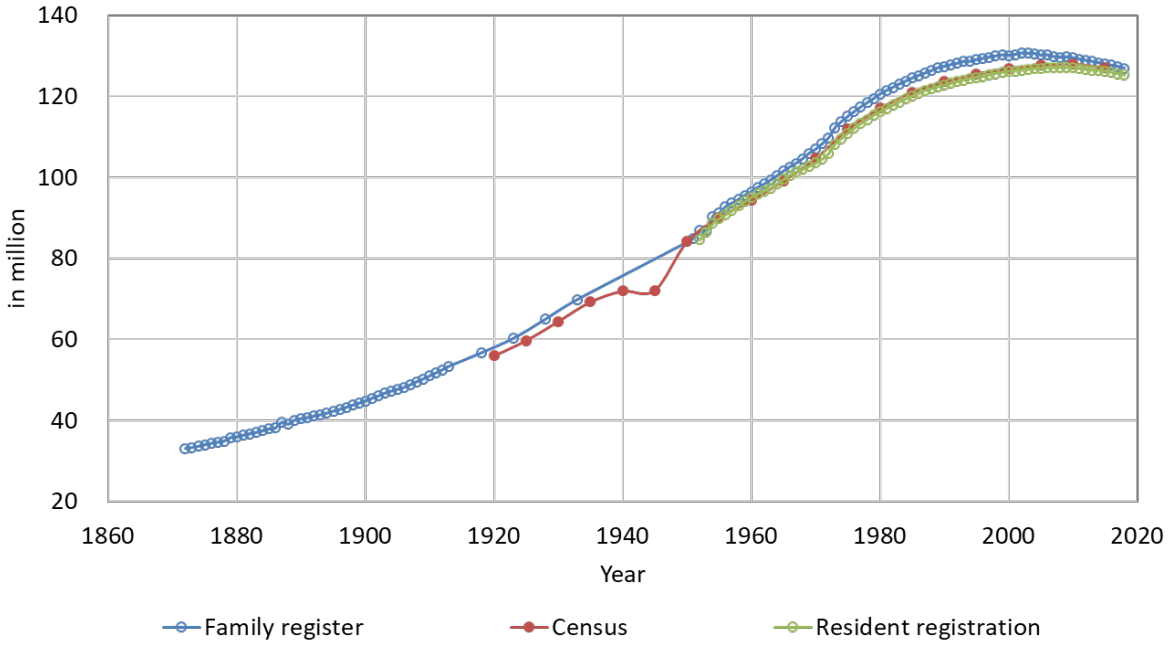
Source : Population census (Statistics Bureau of Japan)

The demographic transition theory, the high fertility and mortality society gradually shifts to the low fertility and mortality society along with modernization and development (Davis 1945, Notestein 1945), also applies to Japan in general. However, there are particularity as well (Hayashi 2017). This paper briefly describes how the population changed since the Meiji era, which is considered to be the starting point of "modernization", how it followed the demographic transition, how people captured and perceived the change and how people reacted. First, the population data sources are described followed by the three components of the population; fertility, mortality and migration, as well as the resultant population ageing.

2. Population data sources

Counting population is the primary governance of a country, and the existence of population statistics system is the proof of the modern state. Although the population register existed in the ancient times since the 6th century and national counts were compiled in the 18th century, Meiji Restoration in 1867 was also the population registration restoration. The family register was re-instated to register every household and family member to the local government by law in 1872. The births and deaths were registered as well, and statistics were compiled and published, first as the reports of family register and hygiene, then as vital statistics from 1899. However, the internal migration registration was not complete. People did register in the new address, but not necessarily de-register the old address; hence the total population figure of the country increased more than the reality. This fact was perceived and created the need for a better, modernized population counts: the census. Knowing the censuses conducted in the USA since 1790, England and France since 1801, the Japanese statisticians at the time considered the population census as the synonym of modernization. Their aspiration realized in 1920. Lastly, the resident registration system created after World War II also started to provide population data since 1952. The three sets of data do not equal each other but show a similar trend (Figure 3).

Figure 3 Population by three sources



3. Fertility

Although the simple indicators of fertility, such as the number of births, its proportion to the total population (crude birth rate) were available since 1872, the total fertility rate (TFR), the average number of children per woman was available since 1925. On that year, TFR was 5.11, then declined to 4.72 in 1930, 4.37 in 1937 (Figure 4). Overpopulation was the population problem at the time, and the Commission for the Investigation of Problems of Population and Food was created by the Prime Minister in 1927. However, at the time, the first policy was the emigration, not the contraceptive promotion nor abortion, which were omitted from the action plan. Hence, the fertility decline during the period could be explained not by policies but by the change of society, such as increased educational level, especially for women, declining infant mortality, or behavior change in line with other industrial nations that went through modernization.

The sudden fertility drop in 1938 and 1939, caused by the Sino-Japanese War, which brought all young men, the potential fathers, to the battlefields, created the momentum for the pro-natalistic policy to raise fertility. After the creation of the Ministry of Health and Welfare in 1938 and the Institute of Population Problems in 1939, the Outline for the Establishment of Population Policy was adopted by the Cabinet in 1941. This Outline set the objective to increase the national population to 100 million in 1960, preached Japanese family to have five children, women to marry instead of work, and promoted the family-centered notion instead of individualism. The effectiveness of this Outline is now questioned, due to the resource constraint made by the rapidly developing war and that the Minister in charge, Mr.Koizumi, who took office six months after the Outline was adopted, dismissed fertility role of the Outline (Takaoka 2011). However, the propaganda penetrated well in the society, and the word “population policy” linked to the wartime totalitarian regime was remembered well into the post-war period.

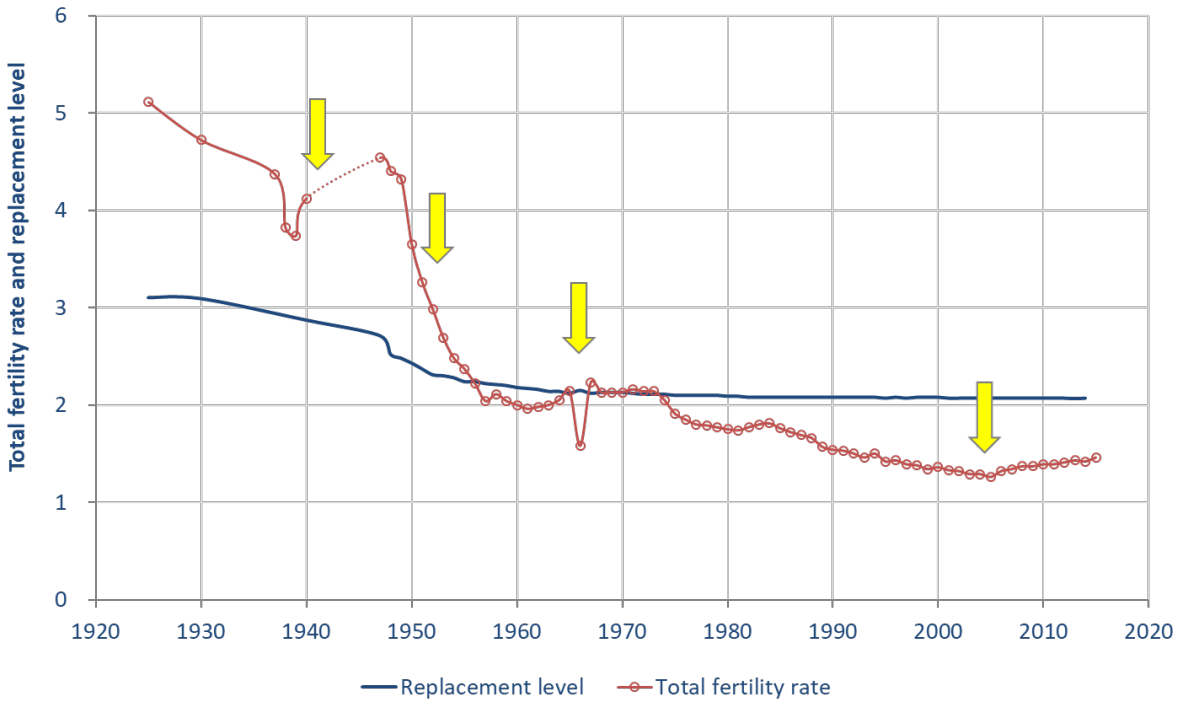
Two years after the war ended, the baby boom started. However, the high total fertility saw a sharp drop right after due to the Eugenics Protection Law enacted in 1948, which opened the way for the induced abortion. It was the law drafted and proposed by the members of parliament, including Mrs.Shizue Kato, one of the first women members of parliament. Family planning expansion followed disseminating through various community-based activities.

The fertility decline continued, and as early as the end of 1950s, it went below the replacement level, the level of fertility so that the population would be stable in the long run. However, few thought low fertility is a problem at the time. People considered that the fertility would remain around the replacement level, which was valid until 1973. Even the fertility level is on the replacement level, the population has momentum. During the time, the population increased over 1 million per year, and people thought limiting births was still necessary. At Japan Population Conference held in Tokyo in July 1974, one month

before the World Population Conference of Bucharest in August 1974, the resolution was adopted so that each couple limits the number of children at most to two to slow down the population increase (Aoki 1974).

It is not certain whether this resolution of the conference was effective, but the total fertility rate started to decrease thereafter. There was no policy to revert fertility to increase, partly due to a taboo on policies to increase fertility, which was associated with totalitarian, pronatalistic policy during WWII, and people were avoiding to mention the explicit measures to increase fertility. It was only in 1990 when the "1.57 shock" hit the society, the national policy framework to tackle low fertility started to be prepared. The total fertility rate in 1989 was 1.57, below that of 1.58 in 1966, which was the year of Hinoe-uma (fire horse) in the Chinese calendar. Due to the traditional belief that the women born on the year of fire horse would eventually burn out the husband, many couples restrained having children in 1966. In 1989, without such incidence, the fertility dropped below the year of 1966, which shocked the society at large and people started to realize the real threat they were facing. The first national policy framework "Angel Plan" was launched for the period from1995 to 1999, followed by similar policies after that, the total fertility rate hit the lowest in 2005 then saw a gradual increase.

Figure 4 Total fertility rate and replacement level

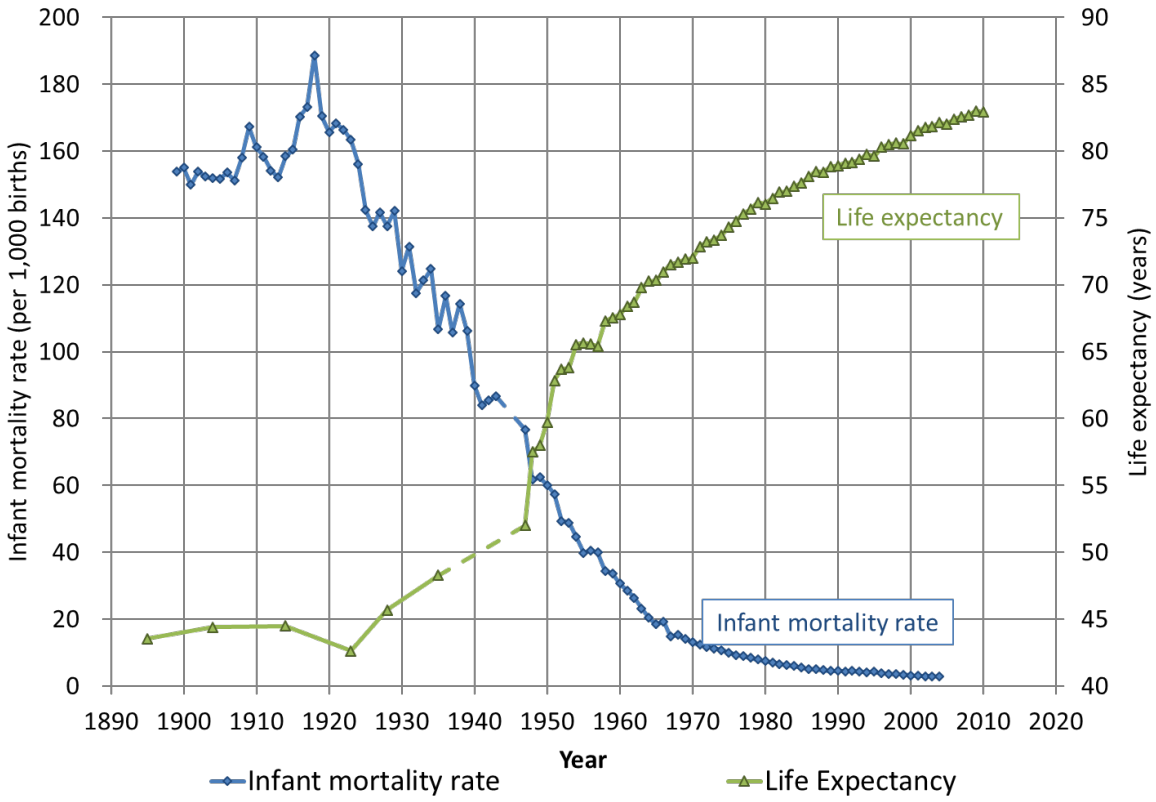


Source : Vital statistics (Ministry of Health, Labour and Welfare), Population Statistics (IPSS)

4. Mortality

As for mortality, the policy is one-directional. Nobody is against the policy to prevent deaths. The policy is not considered as population policy, but rather health policy, and since the introduction of Western medicine even before the Meiji Restoration, the health system, as well as health statistics, saw the rapid development. The difficulty in monitoring the mortality trend in the early Meiji period is that many births were not registered if it ended with infant deaths or even infanticide. The Mabiki, "thinning out" the children who were born, was widely practiced in the Edo period, and some would say it continued to be practiced well into the 20th century (Drixler 2013). If the babies were born and died without registration, it will lower the mortality rate. Due to the low mortality rate in the early Meiji era, even below the mortality rate of Western countries, many suspected it to be under-registration of death and try to correct the mortality to a higher level (Morita 1944, Mizushima 1963, Ito 1998). At least, everybody agrees that the mortality declined from the 1920s, both in terms of infant mortality rate or life expectancy (Figure 5).

Figure 5 Infant mortality rate and life expectancy



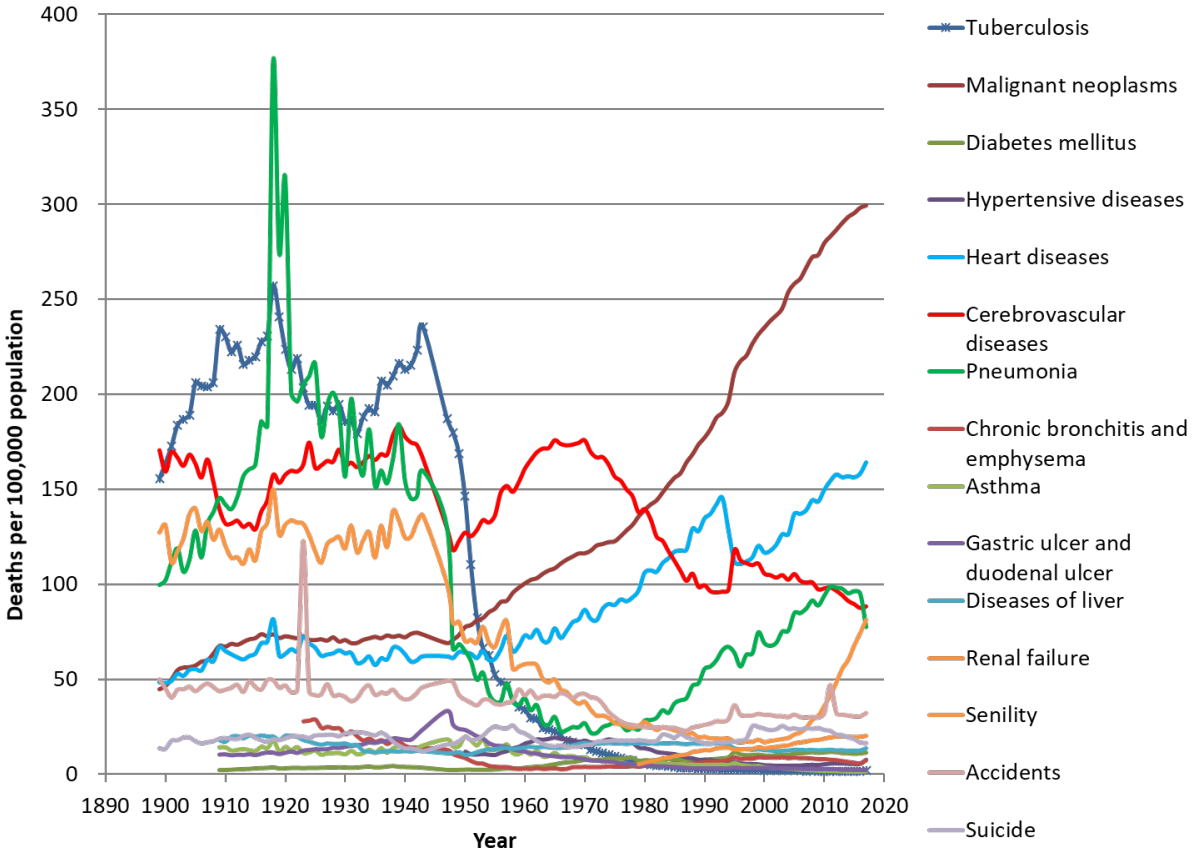
Source : Vital statistics (Ministry of Health, Labour and Welfare)

The period of mortality decline corresponds to the fertility decline from the 1920s, which corresponds well to the demographic transitional theory. The decline might have

started much before, but so far, there is not enough evidence.

In terms of "transition", one can observe the epidemiological transition (Omran 1971) during the 20th century. The largest causes of deaths were tuberculosis and pneumonia; the infectious diseases in the first part of the 20th century then ceded its place to chronic diseases such as cerebrovascular diseases, cancers and heart diseases after WWII (Figure 6). The medical advancement as well as public health improvement could have caused the transition.

Figure 6 Cause specific death rate



Source : Vital Statistics, Ministry of Health, Labour and Welfare, Japan

The causes of death data became available since 1875, following the promulgation of Medical Act in 1874. This Act was drafted by Dr.Sensai Nagayo, who then became the first director of the Bureau of Hygiene. Learning Western medicine in Nagasaki with Dutch Doctor Pompe, Dr.Nagayo realized the importance of public health administration during his trip to the USA and Europe[1] and mandated doctors to report the death of their patient with its cause and to report to the regional medical officer. At the beginning of the Meiji

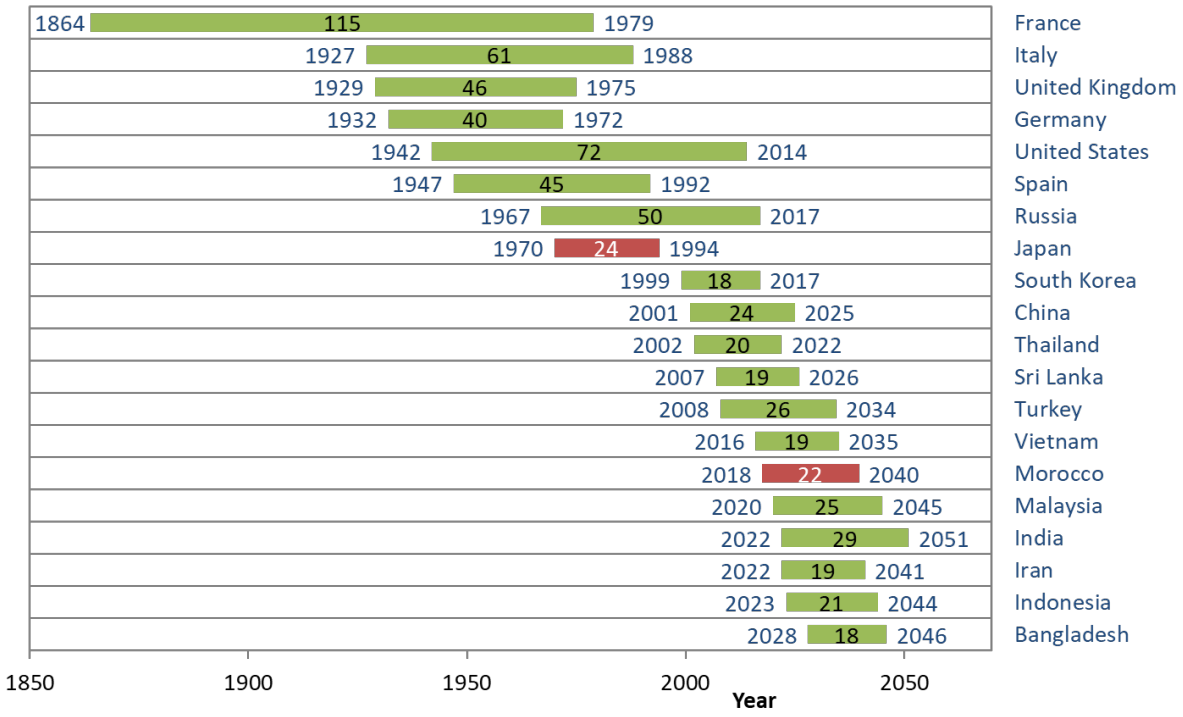
[1] Dr.Nagayo, as a member of Iwakura delegation, departed the port of Yokohama in November 1871, sailed across the Pacific Ocean to San Francisco, moving to Salt Lake City, Washington D.C., Liverpool, London, Paris, Berlin and Amsterdam, and return to his native town in Nagasaki in March 1873.

era, there were 30,000 doctors throughout Japan, mainly practicing Chinese medicine and traditions handed down from father to son. The governmental plan to transform these traditional medical corps to the modern, western-medicine oriented health system was itself another story of modernization, but at least for the cause of death statistics, the coverage became universal within only seven years from 1875 to 1881 based on the existence of doctors throughout the country. The epidemiological transition only happened after WWII, so taking the complete statistics on causes of death does not guarantee instant improvement. However, at least it became the foundation of the health system which saw a great leap in the post-war period.

5. Population ageing

With the declining fertility and extension of life span, inevitably the population gets aged. In 1970 in Japan, the proportion of aged 65 years and over became 7%, and it took only 24 years that this rate surpassed 14%. The 24 years of Japan, the measurement often used to represent the speed of population ageing (Kinsella and He 2009), is much shorter than that of other Western countries such as 115 years of France, 46 years of UK or 72 years of US (Figure 7). Japan had to cope with the unprecedented speed of population ageing which no other countries in the world experienced.

Figure 7 Speed of ageing (years required for 65+% to rise from 7% to 14%)



Note: The year to the left of the bar designates the year in which the percentage of the population aged 65 and above (aging rate) reaches 7%; the number to the right of the bar designates the year when the aging rate attains 14%. The

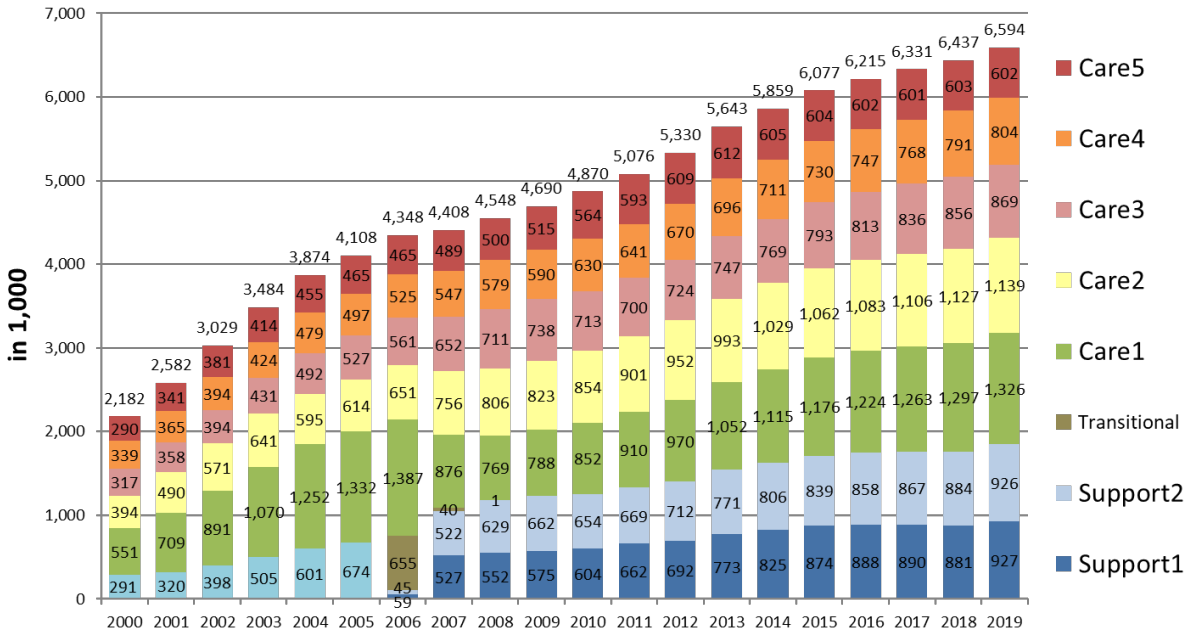
number on the bar designates the years required for that increase.
Source: Kinsella and Wan He (2009); UN (2019) and IPSS (2017)

The health care system evolved along with population ageing. In 1973, the elderly aged 70 years and older were granted free health care. Before that, the older persons felt that they were sick because they were old, and they should refrain from going to the hospital, which was considered somehow luxurious. Now that the care became free, they were entitled to go and get good health care. The access to health care of the elderly improved but improved too well. Elderly who had plenty of time started to go to the clinic too often, beyond necessity, and those clinics became like salons of older persons.

On the other hand, many hospitals became "elderly hospitals" where the bed-ridden elderly were hospitalized. These elderlies did not need acute medical care but could not stay at home as the family member could not provide care at home. Japanese economic expansion slowed down, and this extravagance of tax and insurance money for elderly health care was not tolerable. The reforms of health insurance introduced co-payment for everybody, and long-term care facilities were constructed under the national plan named Gold Plan, to reduce the burden of hospitals and also families.

So far until 2000, the long-term care system developed under the social welfare system, which was financed by public money in collaboration with non-profit social welfare corporations heavily subsidized and controlled by the government. The system included not only elderly facilities but also home help service, day service, or short stay service along with care personnel development. To cope with a further increase of the number of elderly, public long-term care insurance was introduced in 2000 (ESCAP 2015). The principal objectives of this insurance system are to secure the finance by collecting insurance premiums from everybody aged 40 years and over, to diversify the service provider even including for-profit private operators and to improve the quality of long-term care service. The number of care recipients increased rapidly from 2 million in 2000 to 6.6 million in 2019(Figure 8).

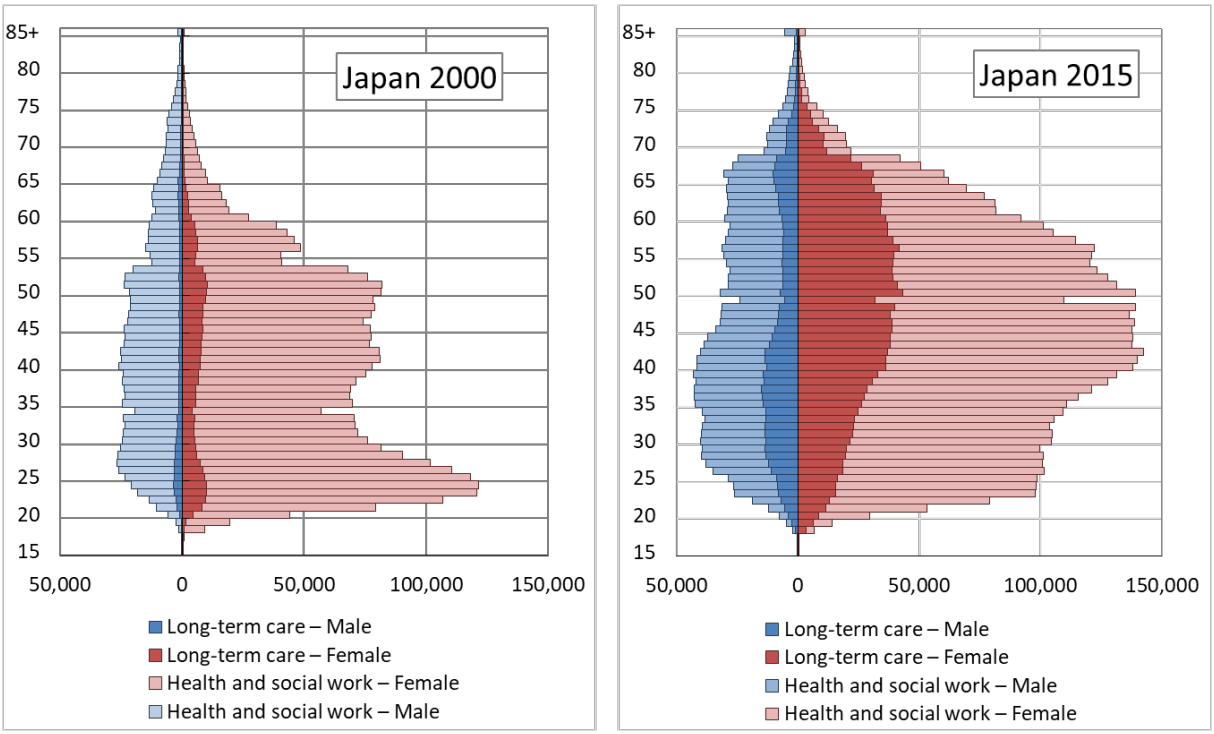
Figure 8 Number of certified to receive long-term care



Note : From 2000 to 2005, Support level had only one level. Number of person is that of April each year.
Source : Monthly Report on the Status of Long-term Care Insurance, Ministry of Health, Labour and Welfare

While there are many issues on the provision of long-term care services under the insurance system, workforce issue is one of the most essential aspects. The lack of care workforce has been a challenge up to present. However, the number of people engaged in the sector indeed increased. While the number of young people declined, many new departments on nursing and social welfare were created in universities and trained many qualified young care personnel. Also, the retention mechanism was sought and developed so that, for example, the young nurses, who used to quit upon marriage, could continue working longer. When compared workforce pyramid of health and social work, one can observe the outcome; In 2000, the health and long-term care workforce was heavily dependent on young women, but in 2015, the majority became the middle-aged women. Many of this workforce are nurses, and measures were taken, such as finding the potential nurses who stay at home, flexible working time system, or career development mechanisms (Japanese Nursing Association 2016).

Figure 9 Workforce pyramid of health and social work / long-term care



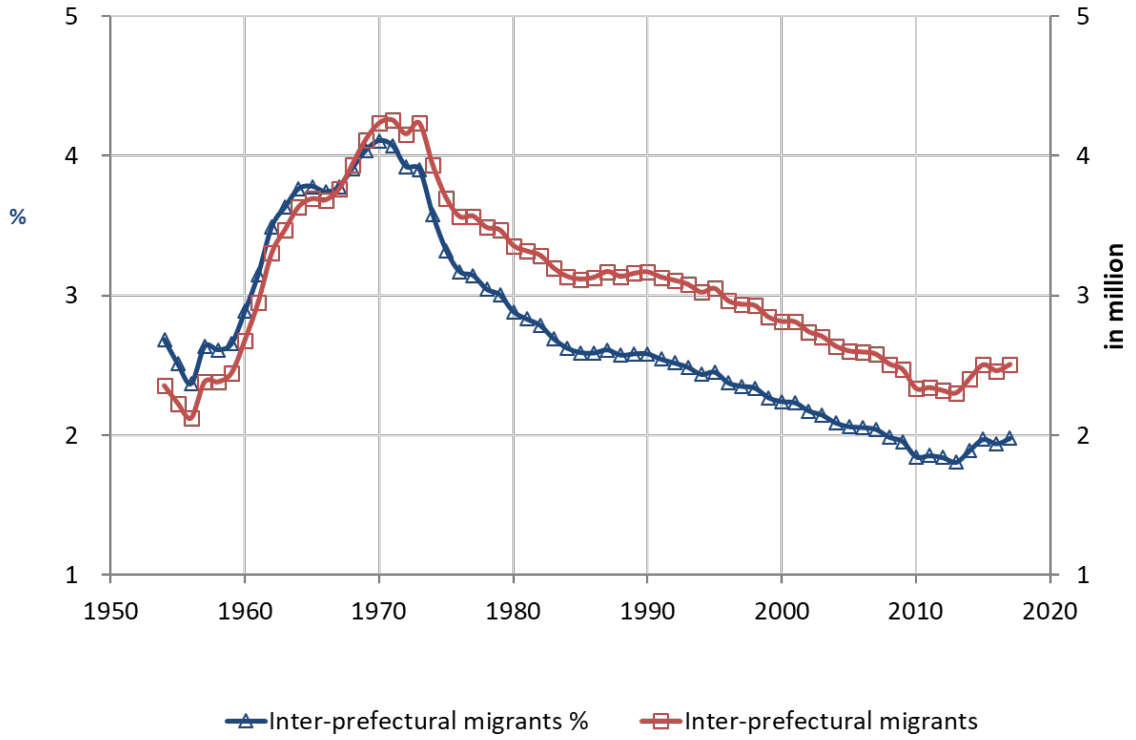
Sources: Population census (Statistics Bureau) in Hayashi et al. (2019)

6. Internal migration

Young people move more often than older people, so the mobility rate of the Japanese population is slightly declining along with population ageing (IPSS 2018). So when the population was younger, there was a massive movement of people; it was the case around 1970(Figure 10). More than 4 million people, which correspond to 4.1% of the total population, moved across the prefectural border in 1970. This timing also corresponds to the lowest employment rates in Japan (Figure 11).

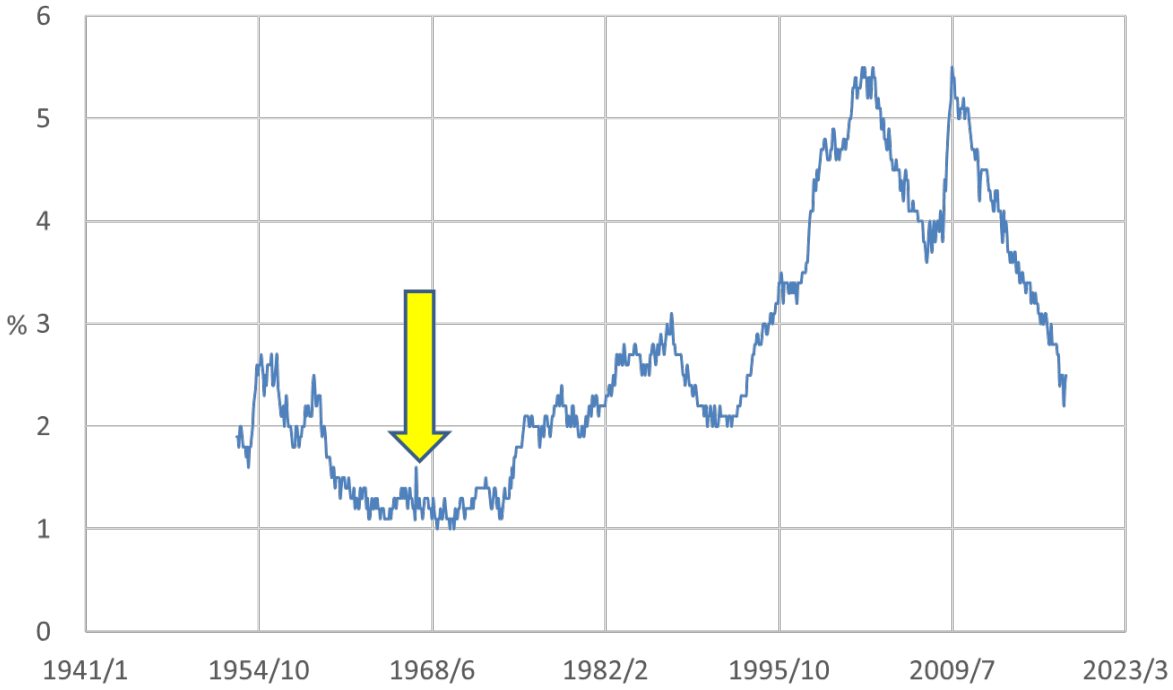
After the post-war turmoil, the period of high economic growth period started around the latter half of the 1950s until the Oil shock hit Japan in 1973. During this period, sometimes called as the Japanese economic miracle, migration was integrated into employment policies. In 1960, the Employment Security Act was amended so that long-distance employment placement became in charge of the public employment security offices. Together with junior high schools and high schools which needed to arrange the employment of the graduates, the long-distance employment was promoted. Under this policy, 12,760 people found their job and moved to the three metropolitan areas; Tokyo, Osaka-Kyoto and Nagoya in 1972 (Ministry of Labour 1973). These policies pushed up the migration rate.

Figure 10 Trend of internal migration



Source : Report on Internal Migration in Japan Derived from the Basic Resident Registration (Statistics Bureau)

Figure 11 Trend of unemployment rate in Japan



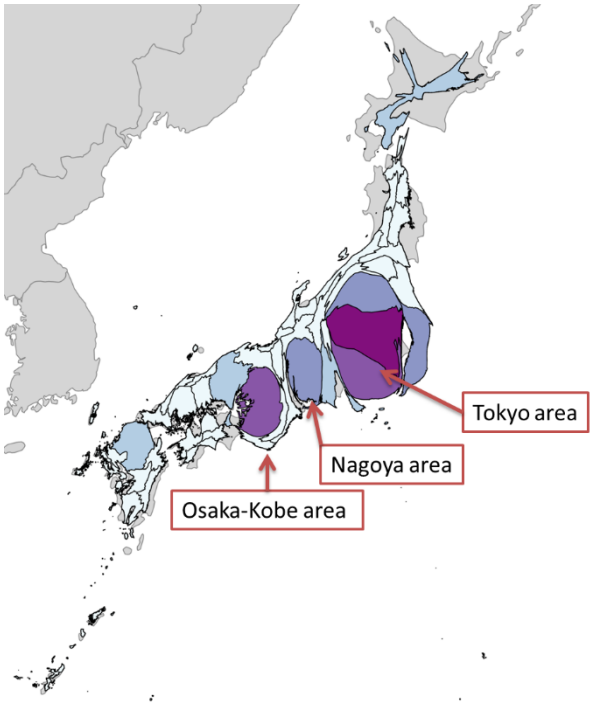
Source : Labor Force Survey (Statistics Bureau)

The Oil Shock hit Japan in 1973 and along with decentralization movement created

by then Prime Minister Mr.Kakuei Tanaka with his best-seller book titled "Building A New Japan - A Plan for Remodeling the Japanese Archipelago" (Tanaka 1973), the internal migration cooled down and counter-migration to the non-metropolitan area occurred.

The concentration of people in metropolitan areas continues up to the present. Figure 12 shows the cartogram of Japan with the size of prefecture according to the population size. Japan is in a form where there are three big chunks in Tokyo area, Osaka-Kobe area and Nagoya area, and shrunk pieces in the north and south.

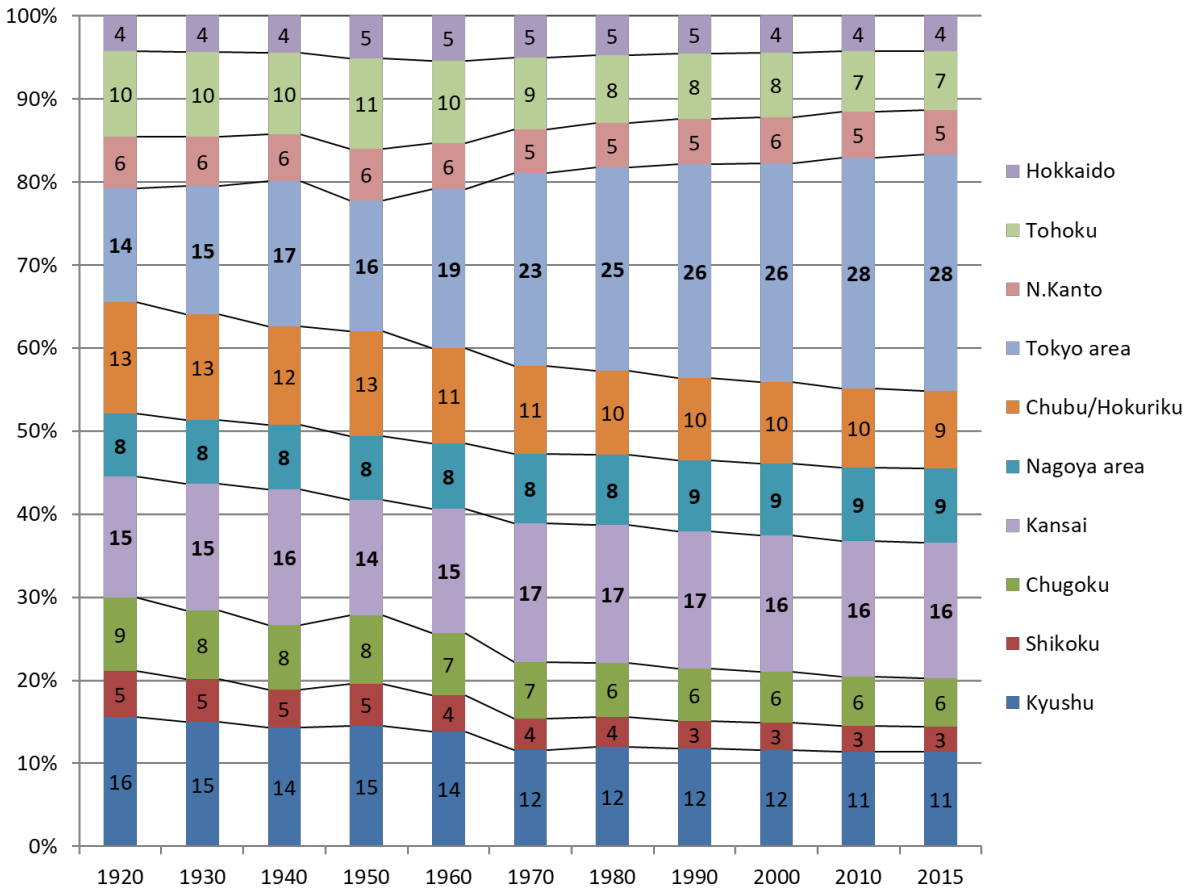
Figure 12 Cartogram by population by prefecture



Source : map created by QGIS using Population Census (2010)

So far the Tokyo area, sometimes defined as the prefecture of Tokyo and surrounding prefectures of Kanagawa, Saitama and Chiba, sometimes defined as Kanto Major Metropolitan Area grouping the municipalities which send commuters to central cities (Statistics Bureau 2018), remains the world's largest urban agglomeration with 37 million people (UN 2018). Although the total population of Japan steadily declines, the Tokyo area keeps attracting people, increasing its proportion from 14% to 28% of the total population from 1920 to 2015 (Figure 13) and hence criticized by other prefectures and municipalities. The Act for Overcoming Population Decline and Vitalizing Local Economy was enacted in 2014, setting the objective to stop the net-migration to the Tokyo area, meaning that more people moving out from Tokyo area than moving in. 2 to 3 trillion yen has been spent annually from the national government budget, but so far, the net-migration of the Tokyo area remains positive (objective not attained).

Figure 13 Proportion of population by region



Sources: Population census (Statistics Bureau)

7. International migration

It is famous that Japan is a closed country with very few foreign residents living within. However, the number kept on increasing, especially since the 1990s, until it reached 2.7 million in 2018 (Figure 14). The Immigration Control and Refugee Recognition Act was amended in 1990 to keep up with the increasing demand for labour backed by the bubble economy of the 1980s. The newly created status of residence "Long Term Resident" applied to Japanese descents, with which the work was permitted. Many children and grandchildren of Japanese migrants in Brazil or Peru came to Japan to work. Besides, the number of Chinese and Filipinos increased notably since 1990.

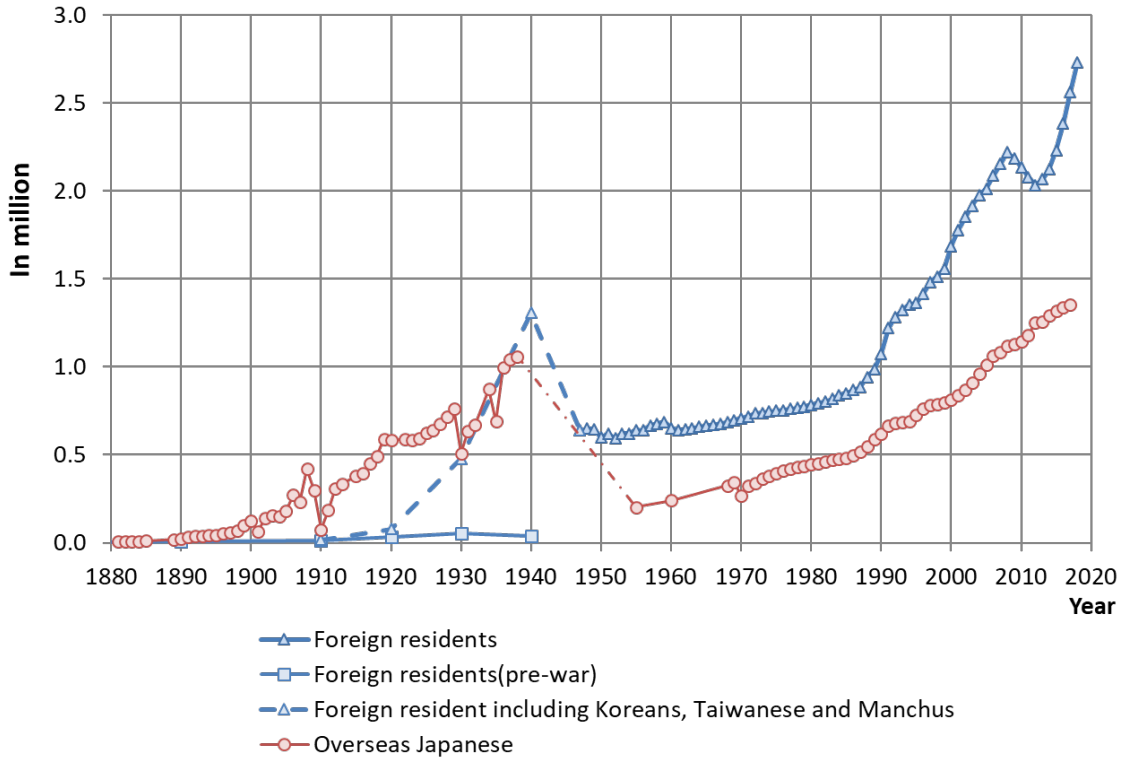
The drop in number in 2009 was due to the global financial crisis. During the period, other OECD countries experienced the same decline, but they soon recovered, which is not the case for Japan. Due to the Great East Japan Earthquake of 2011, which created a mess with the Fukushima nuclear power plant, many foreigners feared and escaped from Japan. The downward trend continued until 2012, and the increase resumed from 2013.

The number of overseas Japanese is also increasing since after WWII. However, a

considerable number of overseas Japanese counted in the pre-war period, and it was only in 2006 when the number exceeded the pre-war level. The pre-war number includes those who stayed in Korea, Taiwan and Manchuria, which were considered as the Japanese territories, but also migrants in other parts of the countries in the world. As described in Chapter 3, the first population policy decided by the Commission for the Investigation of Problems of Population and Food of 1927 was out-migration to ease the population pressure. Compared to European countries at the time, the number of Japanese out-migrants was modest (Morland 2019), but it was significant for Japan.

The massive return of Japanese overseas after WWII created the problem of unemployment and poverty. The out-migration policy existed, but it was not as prevalent as the pre-war period. The number of overseas Japanese remained less than 50,000 until the middle of the 1980s, during the time of the "Japanese economic miracle". This is one example that economic development happened without the remittance of overseas migrant workers. Rather, in the case of Japan, letting the Japanese stay within the country might have boosted economic development, avoiding brain drain.

Figure 14 Trend of international migration

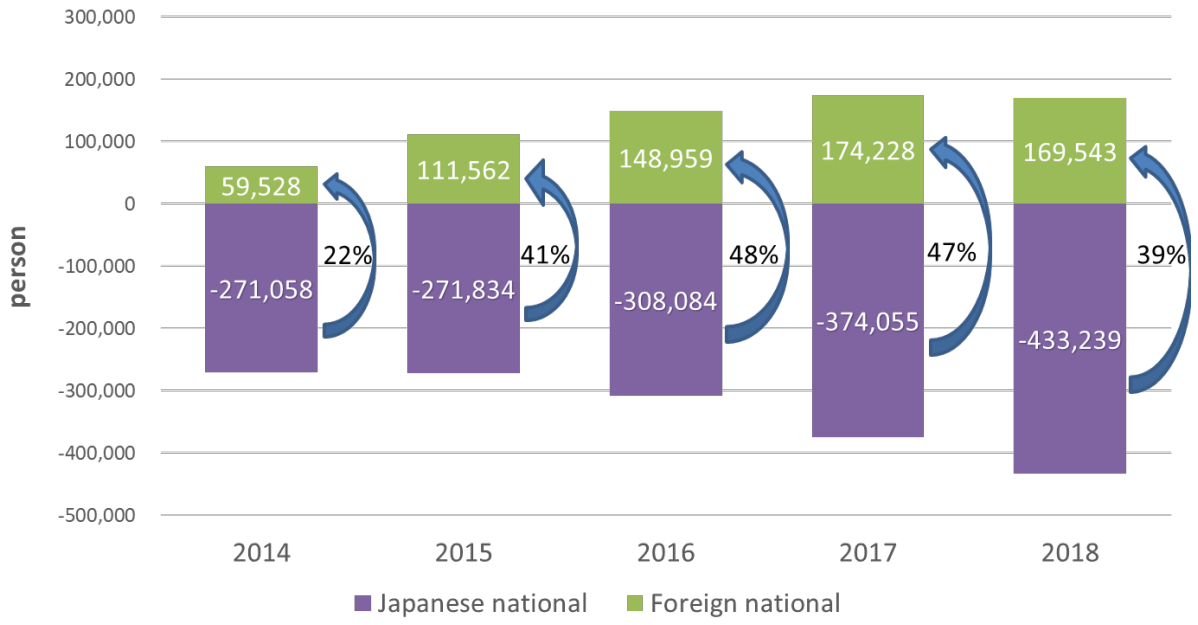


Sources : Foreigners in Japan by statistics on foreign nationals resident in Japan (Ministry of Justice). Overseas Japanese by Annual Report of Statistics on Japanese Nationals Overseas (Ministry of Foreign Affairs).

The population decline was anticipated long before, and there was a debate about whether Japan should take the replacement migration policy, which was suggested by the

United Nations (UN 2001). In 2003, National Institute for Social Security and Population Research organized a public seminar titled "Population Decline and Immigration Policies: Japan's Choice" and discussed whether Japan should take the policy to replace the population decline by accepting foreign migrants. It was a common understanding that the number required to replace the population decline is unrealistically large. However, in the seminar, it became apparent that many policy options were possible, such as exchange through bilateral agreements, social integration policy for foreigners who are already living in Japan, or collaboration between sending and receiving countries to reduce the brain drain (Kojima 2004). After that, the framework of immigration policies moved likewise. The outright replacement policy was not adopted. EPA (Economic Partnership Agreement) opened a way for foreign personnel working in Japan. Social integration policy is now promoting employment and education of foreign children and students. Asian-wide policy frameworks such as Asia Health and Wellbeing Initiative are implemented. As a result, the increase of foreign residents corresponds to almost half of the Japanese population decline since 2016 (Figure 15).

Figure 15 The increase of foreign nationals and the decrease of Japanese nationals



Source : Survey on population, population dynamics and household based on the Basic Resident Registration, Ministry of Internal Affairs and Communications

8. Concluding remarks

Japan is one example of countries in the world. Modernization was brought by Western countries, and efforts were made to learn from them, especially during the beginning of the Meiji era. However, the culture and society developed during the Edo

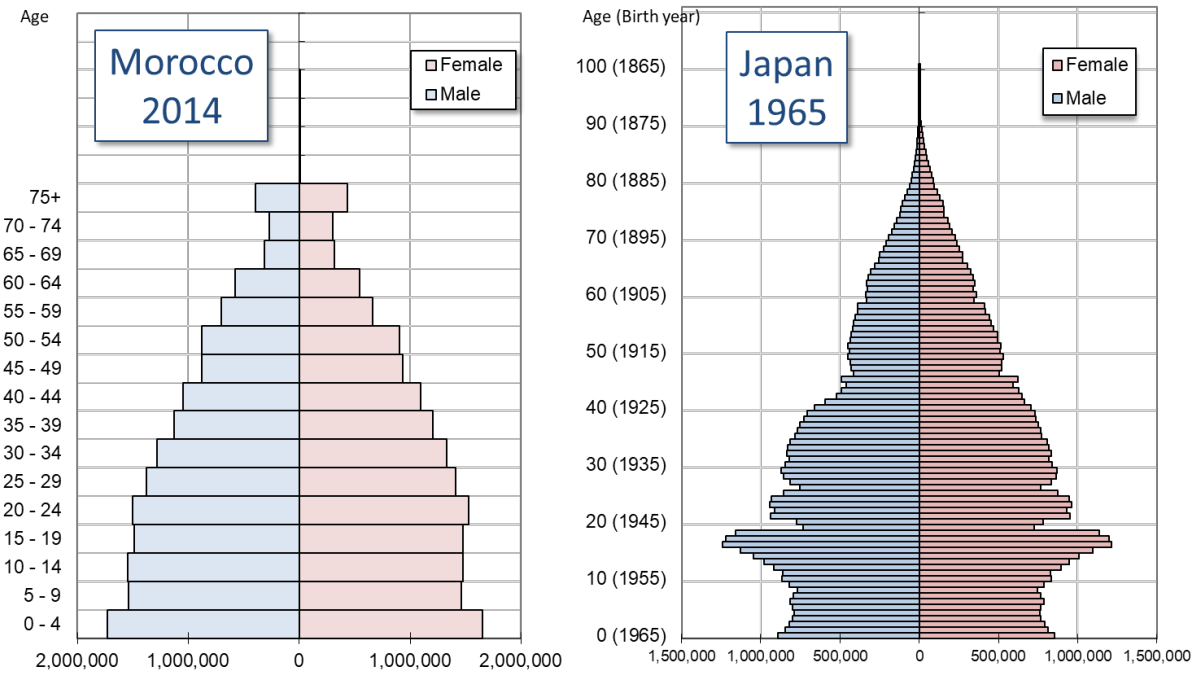
period, and even before, was the base. Also, there was a unique itinerary after the Meiji Restoration.

Looking back on the population trend for the 150 years since the Meiji Restoration, behind the Fuji mountain like total population graph moving smoothly from 37 million in 1884, 128 million in 2010 to 88 million in 2065, fertility, mortality and migration went through not smooth trajectories. In contrast to mortality, where the data, perception and policies correspond rather well with each other, fertility and migration were not always following the same path. Sometimes the issue became taboo, sometimes policies worked, and sometimes policies did not work.

Each country has its course in terms of demographic dynamics. For example, in Morocco, the actual population pyramid looks like that of Japan in 1965 (Figure 17), but the speed of ageing will be even quicker compared to Japan (Figure 7). There are similarities between Morocco and Japan and the differences. Solutions can be found in history or in other countries, but they have to be refined to be adopted to each unique situation.

Population ageing and decline is a challenge, but it is the result of better health, and it could be positively perceived as it will reduce the ecological burden of over-population. Simply we need to understand the population situation correctly by data and respond to the needs created by the population dynamics at the time.

Figure 16 Comparison of population pyramid of Morocco and Japan



Source : For Morocco, Recensement Général de la Population et de l'Habitat, for Japan, Population Census

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